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ABSTRACT

Detailed operational guidelines, training objectives, and learning activities are provided for the Los Angeles Community College District's Skill Training Improvement Programs (STIP II), which are designed to train students for immediate employment. The first of four reports covers Los Angeles Southwest College's computer programming trainee program, providing a plan for instructional methods, evaluation procedures, learning activities, specific training objectives, a Student Occupational Advisory Group (SOAG), and record keeping. The second report offers guidelines for Los Angeles Trade-Technical College's automatic vending machine, electronics, machine operator, and welding programs. While the bulk of this section outlines the training objectives, learning activities, and instructional materials used for each of these occupations, information is also provided on instructor certification, diagnostic testing, training goals, lesson plans, student evaluation, record keeping, coordination of staff, student stipends, and the internal monitoring and data collection required under the college's contract for Comprehensive Employment and Training Act (CETA) funds. The final two activity plans are for Los Angeles Valley College's computer and machine operations programs, detailing procedures for student diagnosis and evaluation, training objectives and activities, books and supplies, SOAG role, and record keeping. (JP)

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STIP II
SKILL TRAINING IMPROVEMENT PROGRAMS
ROUND II

PROGRAM ACTIVITY/TRAINING PLANS

Los Angeles Community College District
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STIP II
PROGRAM ACTIVITY/TRAINING PLAN
LOS ANGELES COMMUNITY COLLEGE DISTRICT

The Program Activity/Training Plan for the Skill Training Improvement Program (STIP II) in the Los Angeles Community College District has the purpose of training the participants for jobs. As the other operational plans it is participant oriented. The advisory groups have approved the plans and will meet as the program progress to assess and to make suggestions for the program activities. The Program Activity/Training Plan needs to be flexible in order to accomodate the needs of the participants and changes in the labor market. The amount of flexibility is limited by the limited resources of the program. However, the program will endeavor to respond to participant needs as much as possible.

In STIP II at the Los Angeles Community College District there are three locations:

<u>LOCATION</u>	<u>OCCUPATIONAL AREA</u>	<u>NUMBER OF PARTICIPANTS</u>
Los Angeles Southwest College 1600 West Imperial Highway Los Angeles, California 90041	Computer Programming	40
Los Angeles Trade-Technical College 400 West Washington Boulevard Los Angeles, California 90015	Welding	25
	Machine Shop	25
	Automatic Vending Machine	25
	Electronics	32
Los Angeles Valley College 5800 Fulton Avenue Van Nuys, California 91401	Computer Operator	34
	Machine Shop	30

A Program Activity/Training Plan is attached for each of the programs.

PROGRAM ACTIVITY/TRAINING PLAN
STIP II

COMPUTER PROGRAMMER TRAINEE
LOS ANGELES SOUTHWEST COLLEGE
LOS ANGELES COMMUNITY COLLEGE DISTRICT

- I. Objective
- II. Classroom Training
- III. Student Occupational Advisory Group (SOAG)
- IV. Record Keeping
- V. Evaluation

PROGRAM ACTIVITY PLAN
CLASSROOM TRAINING ACTIVITIES (STIP)
LOS ANGELES COMMUNITY COLLEGE DISTRICT
LOS ANGELES SOUTHWEST COLLEGE

I. OBJECTIVE:

The purpose of this program is to provide forty participants with advance skills training as computer programmers.

Programmer Analyst	DOT #012.167-066
Programmer Trainee	DOT #219.367-026

II. CLASSROOM TRAINING

A. Instructional Methods

1. Instruction will take place in a classroom setting using various techniques, such as lecture, computer lab work, individual studies and small group activities.
2. These methods will be augmented with textbooks, audio visual equipment, computer workbooks, and hands on experience with the computer on site.

B. Procedure for Evaluation; Participant Progress

1. Participants will be periodically tested on weekly, monthly and quarterly basis depending upon subject area. A grade will be assigned and a record kept of the grades.
2. Each participant will have a series of computer projects to complete before he can advance to the next project. Each project is more advanced than the prior project, and it requires a higher programming skill level to complete.
3. Each instructor will design an individual plan for each participant. This plan will be changed from time to time based on diagnostic testing.
4. The instructors and director will be operating under the team concept and will evaluate each participant on a monthly basis in a private meeting consisting of the instructor, director, and the participant. Any necessary changes in the program regarding the participant will be made at the time of this meeting. This form for certification of evaluation will be maintained in the participants file.

5. Process and standards for determining that the participant is ready for placement.
 1. Participants will be considered for placement when they master the skills necessary to complete each project supplied.
 2. A final grade for each project completed and this grade will be maintained in the participant's performance records.

C. Curriculum

1. Identification of specific training objectives of skills and knowledge to be mastered by the participant.
 - a. Computer programmer skills
 1. Introduction to Data Processing
 2. Ansi Cobol
 3. Job Control Language
 4. Application Programming
 - b. Additional training and skills studied during the training program.
 1. English Fundamentals
 2. Math Fundamentals
 3. Business Administration
 4. Accounting
 5. Computer Math
 - c. Job Preparation
 1. Finding a job
 2. Applying for a Job
 3. Job Attitude
 4. On-the-job Thinking
 5. Survival Skills

2. Training Activities

The training objectives will be accomplished by the following activities:

	<u>APPROXIMATE NUMBER OF HOURS</u>	<u>STAFF RESPONSIBLE</u>
a. Introduction to Data Processing	300 hours	instructor
1. Development of Data Processing Industry		
2. Fundamental concepts		
3. Data Processing vocabulary		
4. Data Processing equipment		
5. Flow Chart techniques		
6. Programming		
7. Comparison of Languages		
8. Operating Systems		
9. Systems Analysis		
10. Data Base Management		
b. Ansi Cobol	400 hours	instructor
1. Structure of Language		
2. Utilization of Language		
3. Use sort feature		
4. Report Writer		
5. Direct access usage		
6. Table handling		
7. Advanced Program Application		

	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE instructor
c. Job Control Language	140	
1. Create and delete data sets		
2. Code job		
3. Compile link edit		
4. Run Program		
a. Disk packs		
b. Tape Drive		
c. Other special features		
d. Application Programming	300	instructor
1. Design and coding of Application Programs		
2. Structured Programming		
3. Top-down Programming		
4. Modular Programming		
5. Sub-Programming		
e. Additional Training or Skills		
1. English Fundamentals	60	instructor
a. Grammar		
b. Spelling		
c. Punctuation		
d. Writing		
2. Math Fundamentals	60	instructor
a. Review of Arithmetic fundamentals		
b. Solution of Practical Problems		

	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE instructor
3. Business Administration	30	
a. Basic Business Concepts		
b. Management		
c. Finance		
d. Marketing		
e. Operations		
f. Report Writing		
g. Business Communication		
4. Accounting	30	instructor
a. Accounting Theory		
b. Record Entries		
c. Ledgers		
d. Adjustments and Closings		
e. Accounting Procedures		
5. Computer Math		
a. Modern Techniques of Calculation		
b. Solving Technical Problems		
f. Job Preparation	120	job developer
1. Finding a Job		
a. Job Search Techniques		
b. Personal Interviews		
2. Applying for a Job		
a. Resume		
b. Job Applications		
c. Employer expectations		
1. Habits		
2. Grooming		

3. Job Attitude

- a. Employee Rights
- b. Employer Rights
- c. Unions

4. Personal Finance

- a. Personal Budgets
- b. Checking Accounts
- c. Credit

D. Student Progress

1. The First Three Months

- a. By the first three months of the program the students would be able to read a card file and do minor processing of that card file and print a report from the processing of the card file. He should be familiar with the structure of the COBOL language and how the language is utilized.
- b. The student should also be familiar with data processing environment in general. Such as computer hardware, history of computers, and concepts of data processing.

2. The Second Three Months

- a. By the second three months of the program the student would be able to read a card file with multiple records and process the card file and produce a printed report. The student should be able to use certain programming techniques such as table handling, the "IF" statement level 88, in working storage, and multiple reports.
- b. The student should be familiar with other programming languages such as FORTRAN, RPG, AND BASIC. The student should have a working knowledge of the language and its structure. Some programming is involved using these languages.

3. The Third Three Months

- a. By the third three months the student should be able to write advance COBOL application programs using special features such as the report writer, sort verb tape drives, disk packs, and utilization third generation computers. The student should be able to utilize JCL services and other utilities used to perform certain unctions needed to complete the programming task.
- b. The student should be able to read multiple files and write multiple record on each file. The student should be able to produce multiple reports and advance processing of data and using advance programming logic.

4. The Final Three Months

- a. The final three months the student should have developed advance programming techniques such as structured programming, top-down programming and modular programming.
- b. The student should be familiar with sub programming structure and techniques. The student should be able to converse technically with other computer programmers and other technical personnel in the field of computer technology.

5. Paid Holidays Besides Legal

Martin Luther King's Birthday
Day after Thanksgiving
Christmas Week
Day before New Year's

III. ADVISORY GROUP (SOAG)

The Advisory Group will review the curriculum before training is started. Minutes of the meeting will be maintained. The Advisory Group will assist as a resource for job placement and defining skills required. The Advisory Group will meet throughout the program to provide guidance and assistance.

IV. RECORD KEEPING

A sign-in and sign-out sheet will be maintained as a record of student attendance. Records of student performance on test and evaluations will also be maintained.

V. EVALUATION

Students will be evaluated monthly based on performance in class, on tests and other evaluations. Based on the evaluation and on the employability plans, the participant will be counseled and a plan to correct any deficiencies will be developed.

PROGRAM ACTIVITY/TRAINING PLAN
STIP II

AUTOMATIC VENDING MACHINE,
ELECTRONICS, MACHINE OPERATOR
WELDER

LOS ANGELES TRADE-TECHNICAL COLLEGE
LOS ANGELES COMMUNITY COLLEGE DISTRICT

- I. Classroom Training
- II. Participant Educational and Training Goals
- III. Lesson Plans
- IV. Participant Evaluation
- V. Record Keeping
- IV. Coordination of Program Components
- VII. Allowance Payments
- VIII. Internal Monitoring
- IX. Contract Compliance
- X. Management Information System
- XI. Curriculum
 - A. Automatic Vending Machine
 - B. Electronics
 - C. Machine Operator
 - D. Welding
- XII. Calendar

PROGRAM ACTIVITY PLAN
LOS ANGELES TRADE-TECHNICAL COLLEGE

CITA-STIP

I. CLASSROOM TRAINING

Educational and occupational skills will be provided participants in accordance with the employability plan which they helped construct.

This component is comprised of the following:

Certification of Instructors

All instructors are certified prior to becoming employees of the college district. Prospective instructors are processed by the Personnel Division, Los Angeles Community College District, after authorization by both the administrator and approval of the Director. Certification is granted by the California State Department of Certification and Licensing only after rigid eligibility is documented to the State.

Diagnostic Testing

Specific educational deficiencies of each participant are assessed as part of the program.

Diagnostic testing occurs throughout the program but commences prior to final selection of prospective enrollees. Each instructor maintains a simple battery of occupational cluster oriented assesement tests which relate to the past success of job ready graduates. These are conducted during a three day stay in the occupational setting chosen by the applicant as his primary interest area. These tools, accompanied by manual dexterity observation, generally indicate the training facility and aptitude this client will demonstrate as compared to similar clients in the past. Welding would include an opportunity to assess client reactions to sparks, heat and smoke, as well as tendencies toward claustrophobia from welding in a booth.

During the actual instructional phases of the program, every occupational training cluster utilizes one of the most effective diagnostic tools devised:

Performance Objectives (See Addendum) These are a series of step-by-step process which, when taken together, constitute all the skills a client should be able to perform upon completion. Each instructor and his trainees measure trainee progress or lack of progress by the additional number of observable, performance objectives accomplished since the previous assessment.

In summary, successful completion requires that each trainee be able to perform the basic occupational skills requisite to his employability plan. Progress charts, blocking in the various assignments or jobs to be completed, are kept for each participant. Diagnostic Testing for supplementary educational needs is available through the Learning Lab, which can pre test any client in reading, English, Math, GED Subjects, and/or employment forms completion. Diagnostic attitudinal testing is an informal process carried on by both the intake and employability counselor through interviews and by the instructor through regular conferences. An evaluation itemizing attitudinal skills related to positive employment is part of the evaluation sheet discussed and signed by both the instructor and the trainee.

II. PARTICIPANT EDUCATIONAL AND TRAINING GOALS

Participant Educational and Training Goals, as indicated in the Administrative Component, Intake Component and Employability Component plans is a joint process, initiated by the intake counselor based on input from the instructor's analysis and the client's perceptions, and reinforced by the counselor and instructor. All trainees receive theory and shop practice daily, including related math and attitudinal reinforcement. Trainees needing extra shop math, or remedial education, are referred to the Counselor who will schedule them for these extra sessions and incorporate them into the employability plan.

Through utilization from the occupational training cluster concept, every trainee, has options for a Borad job perspective within a cluster which becomes more specific as completion of the program approaches. Example: trainee all start with the BASIC elements, including Basic English and Math, and Technical Procedures. As they advance, their interest and capabilities may reflect a specific aptitude for certain narrower fields or occupations. See Exhibit K.

Since trainees ENROLL at slightly different periods, they may COMPLETE their programs in different lengths of time, and require VARYING SKILLS, all programs are INDIVIDUALIZED: that is, each individual's program is designed around the PERFORMANCE OBJECTIVES of each individual. Employment orientation is the key to obtaining jobs and placing trainees on jobs has been, since the college was first opened, the reason for the college existence. We have always served a clientele who were in the college to be trained and placed on jobs. Such items are grooming, work habits, the place of the trainee in the world of work and the rights and responsibilities of both employer and employee are part and parcel of the ongoing training program. Before placement, trainees are taught techniques of job-finding, application preparation and resume development, role playing in mock interviews, and unions and future trainee relationships with unions are discussed. Participants will sign a verification of this orientation, and the verification will be placed in the participant's file folder.

III. LESSON PLANS

Lesson plans are required for all educational programs by the Administrator. Progress evaluations are both skill and attitudinally based. Based on the instructor's lesson plans for the coming week, individual trainees receive assignments (including any necessary homework) for that week.

IV. PARTICIPANT EVALUATION

Individual conferences are held monthly to review each participant's progress. Written copies of the evaluations are provided in Exhibits D-1 to D-4.

V. RECORD KEEPING

Record keeping is kept on several forms, since certified attendance is required by the college District, the California State Department of education and contract agencies for payroll. Each instructor completes a official teacher-certified document requiring daily attendance in hours. Additionally, a "Certification of Attendance" is submitted weekly to the CETA Director detailing hours of absences and attendance for payroll verification. See Exhibit J. Payroll time cards are filled out directly from the certification of attendance. The cards are completed according to Los Angeles City CETA auditing procedures. These are then cross-checked by our allowance payment office against weekly reports. Individual Participant File Folders are maintained which include participant performance documents, training progress, attendance records and source documents.

VI. COORDINATION OF PROGRAM COMPONENTS

Program coordination is provided through weekly meetings between counselors and the administrator, and informal continuous feedback from all staff. Each coordinator is given a specific component for coordination and monitoring (See Exhibit C-1). Secretarial staff is available to all component personnel. Physical housing configurations strengthen the processes and record keeping for each component. For example, the INTAKE COMPONENT is housed together with a clerk within the room, facilitating initial application and interviewing, and client record accessibility. The JOB DEVELOPMENT/PLACEMENT COMPONENT is located in an adjacent area, providing access to the files and assistance during the Employability Planning Process. Initial Job Development planning is conducted by the Intake Counselor but then shifts to the J.D./P. Counselor, who coordinates this process with each instructor. Interaction among all component coordinators and the training component occurs daily. Skill center weekly reports are distributed to all staff, indicating enrollment and termination data.

VII. ALLOWANCE PAYMENTS

Trainee Allowance Payments, time card submissions, payroll processing and trainee stipend distribution, and record keeping for the above functions are coordinated by a coordinator who maintains an accurate record of student attendance, payroll, time keeping, and warrant disposal. Employee time reporting is kept in accordance with College District policy. Documentation is available for inspection upon request, and all clients are certified as eligible under guidelines established by City CETA. Section 95.34 of the CETA Rules and Regulations will be honored and adhered to.

VIII. INTERNAL MONITORING

Internal monitoring is accomplished through the establishment of performance goals which reflect the expectations of contracted obligations and continual review of the Statement of Work and other provisions of the City CETA contract.

INTAKE AND ENROLLMENT goals are established on a monthly basis, then broken down week by week. This plan reflects the need to achieve the "Significant Segment Plan" approved by City CETA. Applicants are selected which approximate the openings available and Significant Segment provisions. To assure that every enrollee has full employability potential, instructors have the opportunity to interview potential candidates for their programs. Applications are examined by our Counseling office to assure residence and financial eligibility. All intake data is on file in a trainee folder, available for inspection by staff and subject to review by the administrator.

PAYROLL AND STATISTICS - Statistics for each component originate, verified and maintained by our Counseling office under the direction of the administrator.

COUNSELING - Regular reports are disseminated from the counselor to all component giving important program feedback to other components. All referrals, counseling sessions are noted when they affect the employability plan. The counselor visits and observes trainees in their classes, providing additional feedback on classroom sessions and trainee progress. At coordinating meetings this feedback is the program modifications.

JOB DEVELOPMENT/PLACEMENT FOLLOW-UP - Counselor for this area is required to document and submit all changes and employment information and to record these on specific forms. Copies of these forms are filed in each trainee's folder. Additionally, a monthly report is submitted to the District Office for centralized monitoring. Weekly sessions with other components and daily sessions with instructors verify information accuracy. All counselors have a copy of the performance requirements.

IX. CONTRACT COMPLIANCE

Contract Compliance occurs at every level of program operation. Responsibility for contract compliance via negotiations, submission of reports and statistics or modifications is coordinated by the Director of the CETA Programs for each college on behalf of the Community College District. Monitoring is conducted regularly by CETA Programs Director, or Staff who coordinates their findings with the administrator on-site regarding contract performance Standards. Each term and condition of the contract is monitored to maintain compliance.

X. MANAGEMENT INFORMATION SYSTEM

A system is maintained and monitored at the college level with respect to requirements of the:

Contract Performance Standards
Participant Service Plan
Participant Characteristics Plan

Figures relating to the above are monitored at the Central Office level to assure performance. Additionally, the Monthly Program Expenditures Plan is monitored jointly by the Central Office and the Accounting Division. The system will be maintained in accordance with the provisions of the LACCETA Management Information Systems Manual and CETA Rules and Regulations.

XI. CURRICULUM (see attached)

XII. CALENDAR OF HOLIDAYS

Participants will be paid for legal holidays and the following:

Martin Luther King's Birthday
Day after Thanksgiving
Christmas week (Dec. 24, 26, 27, 28, 1979)
New Year's Eve

CURRICULUM
FOR
WELDING

STIP II

LOS ANGELES TRADE-TECHNICAL COLLEGE
LOS ANGELES COMMUNITY COLLEGE DISTRICT

CURRICULUM
FOR
WELDING
STEP II
LOS ANGELES TRADE-TECHNICAL COLLEGE
LOS ANGELES COMMUNITY COLLEGE DISTRICT

I. TRAINING OBJECTIVES

- a. Fundamentals of mathematics in Welding
- b. Knowledge of Safety Procedures
- c. Knowledge of Principles of and Training in Oxy-Acetylene Welding and Cutting
- d. Knowledge and application of horizontal, vertical, and overhead groove welds on different thickness of high and low alloy steel plates using different types of coated electrodes.
- e. Knowledge of set up and operation of automatic flame cutting machines for automatic flame cutting of light and heavy gauge ferrous metals.
- f. Knowledge of Aluminum, Stainless and Carbon Steel Welding including maintenance and operation of semi-automatic Gas Shielded Welding Equipment.
- g. Ability to read blue prints to build structures of welded parts.

II. TRAINING ACTIVITIES

APPROXIMATE
NUMBER OF HOURS

STAFF
RESPONSIBLE
Welding
Instructor

a. Fundamentals of Mathematics in Welding

80

1. Properties of Common Fractions:

- a) Fractions and mixed numbers
- b) Reducing fractions to lower and higher terms
- c) L.C.D. and L.C.M. in addition and subtraction of fractions
- d) Multiplication and division of fractions
- e) Determining relative magnitude of fractions
- f) Practical applications of common fractions

2. Analyzing Decimals and Decimal Fractions:

- a) Decimal fractions, decimals, and mixed numbers
- b) Addition and subtraction of decimals
- c) Multiplication and division of decimals
- d) Changing common fractions to decimals, and uses of the decimals-equivalent table.
- e) Selection of gage block, decimal limits and tolerances
- f) Practical applications of decimals and decimal fractions

3. Square Root

- a) The index of the root and the radical sign
- b) The square root of a perfect square, whole number, and a decimal
- c) Extracting square root by factoring, and the square root of fractions

1. Understanding Percent

- a. The ratio method of writing percent
- b. Changing percents to decimals; fractions
- c. Ratio, proportion and percent
- d. Find the percentage by using a proportion, a decimal; fractions
- e. Find the rate by using a decimal or a fraction
- f. Find the base by using a decimal or a fraction
- g. Practical applications

2. Application of Formulas

- a. Definition of the formula
- b. Coefficient of a term
- c. Power, exponent
- d. Roots
- e. Adding and subtracting like terms
- f. Combining like and unlike terms
- g. Analyzing formulas
- h. The axioms of equality
- i. Rearranging formulas by using several axioms
- j. Practical applications

	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
3. Introduction to Shop Formula	240	Instructor
a. Algebraic expressions		
b. Finding the value of numerical and literal expressions		
c. Adding and subtracting		
d. Multiplication and rules of exponents		
e. Division and rules for signs and exponents		
b. Knowledge of Safety Procedures	continuous	Instructor
c. Knowledge of Principles of and training in Oxy-Acetylene Welding and Cutting		
1. Safety Test		
2. Overview of Course		
a) Shop and grading policies		
3. Explanation of School Policies (Lecture)		
4. Assignments from Textbooks, Films and Lectures		
1. Standard Testing Procedures		
2. Qualification Tests		
3. Renewal of Qualification Test		
4. Films and Slides		
5. Employment Standards		
5. Introduction to Shop Practices:		
a. Explanation of shop practices		
b. Shop Safety		
6. Operation and Care of Equipment:		
a. Explanation and demonstration of equipment		
b. Proper care of equipment		
c. Flame adjustment		
7. Welding in Flat Position:		
A. Forehand Technique:		
1. Beads on 3/16" steel plate		
2. Beads with rod on 3/16" steel plate		
3. Vee-Groove joint 3/16" steel plate		
4. Lap-joint (fillet weld) 3/16" steel plate		

B. Development of Welding Techniques:

1. Tee joint horizontal position E-6010, 5/32 dia. 3/8" thick steel plate
2. Tee joint vertical position E-6010, 5/32 dia. 3/8" thick steel plate
3. Tee joint overhead position E-6010, 5/32 dia. 3/8" thick steel plate
4. Lap joint vertical position E-6010, 5/32 and 1/8 dia. 3/8" thick steel plate
5. Lap joint overhead position 5/32 and 1/8 dia. E-6010 3/8" thick steel plate
6. Tee joint vertical position 5/32 dia. 3/8" thick steel plate
7. Tee joint overhead position 5/32 dia. E-6011 3/8" thick steel plate
8. Lap joint vertical position 5/32 dia. E-6013 1/4" thick steel plate
9. Lap joint overhead position 5/32 dia. E-6013 1/4" thick steel plate
10. Corner joint vertical position 1/8 dia. E-7014 3/8", 1/4" thick steel plate
11. Tee joint horizontal position 1/8 dia. E-7018, 3/8", 1/4" thick steel plate
12. Tee joint vertical position 1/8 dia. E-7018, 3/8", 1/4" thick steel plate
13. Tee joint overhead position 1/8 dia. E-7018, 1/8", 1/4" thick steel plate
14. Lap joint overhead position 1/8 dia. E-7018 3/8", 1/4" thick steel plate
15. Tee joint horizontal position 1/8 dia. E-7024, 3/8" thick steel plate
16. Butt joint horizontal position 1/8 dia. E-6010, 1/8" thick steel plate
17. Butt joint vertical position 1/8 dia. E-6010, 1/8" thick steel plate
18. Butt joint overhead position 1/8 dia. E-6010, 1/8" thick steel plate
19. Single vee groove horizontal position 5/32 dia. E-6010, 3/8" thick steel plate
20. Single vee groove vertical position 5/32 dia. E-6010, 3/8" thick steel plate
21. Single vee groove overhead position 5/32 dia. E-6010, 3/8" thick steel plate
22. Soundness groove vertical position 1/8 dia. E-7018 and 1/8 dia. E-7024, 3/8" thick steel plate
23. Soundness groove overhead position, 1/8 dia. E-7018 and 1/8 dia. E-7024, 3/8" thick steel plate

7. Welding in Flat Position: (cont.)

B. Backhand Technique:

1. Beads on 3/16" steel plate
2. Beads with rod on 3/16" steel plate
3. Lap-Joint (Fillet weld) 3/16" steel plate
4. Square-Butt, weld 3/16" steel plate
5. Bevel-Joint 3/16" steel plate
6. Vee-groove joint 1/4" steel plate

8. Welding in Vertical Position:

A. Forehand Technique:

1. Beads with rod on 3/16" steel plate
2. Square-Butt joint 3/16" steel plate
3. Bevel-Joint 3/16" steel plate
4. Vee-Groove joint 3/16" steel plate

9. Welding in Horizontal Position:

A. Backhand Technique:

1. Beads with rod on 3/16" steel plate
2. Bevel-Joint 3/16" steel plate
3. Square-Butt joint 3/16" steel plate
4. Vee-Groove joint 3/16" steel plate
5. Fillet weld (T-Joint) 3/16" steel plate

10. Welding in Overhead Position:

A. Forehand Technique:

1. Beads with rod 3/16" steel plate
2. Vee-Groove joint 3/16" steel plate
3. Bevel-Groove joint 3/16" steel plate
4. Square-Butt joint 3/16" steel plate

- d. Knowledge and application of horizontal, vertical and overhead groove welds on different thicknesses of high and low alloy steel plates using different types of coated electrodes

1. Introduction to Burning Equipment - Manual Flame Cutting

A. Operation of Equipment:

1. Adjusting line pressures
2. Lighting the torch
3. Handling Oxygen Lever
4. Burning steel
 - a. Cutting a straight line
 - b. Hand beveling
 - c. Piercing
 - d. Burning a roundhole
 - e. Operation of circular cutter

	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
e. Knowledge and set-up and operation of automatic flame cutting machines for automatic flame cutting of light and heavy gauge ferrous metals	80 hours	Instructor
1. The TIG Process		
a. History and development		
b. Torch assembly		
c. Purpose and function of automatic flame cutting		
d. Material preparation		
e. Recommended safety practices		
2. Welding Machines and Accessories		
a. Construction and Care		
b. Machine operation		
c. Sequence of operation		
d. Remount control details		
e. Control Details		
f. Grinder operation		
g. Cutting demonstration		
f. Knowledge of Aluminum, Stainless and Carbon Steel welding including maintenance and operation of semi-automatic Gas Shielded welding equipment	280 hours	Instructor

Theory

1. The TIG Process
 - a. History and development
 - b. TIG torch assembly
 - c. Purpose and function of inert gases
 - d. Electrode configuration
 - e. Material preparation
 - f. Recommended safety practices
2. Welding Machines and Accessories
 - a. Construction and care
 - b. Machine operation
 - c. Sequence of operation
 - d. Remount control details
 - e. Control details
 - f. Grinder operation
 - g. Welding demonstration

3. TIG Welding Equipment

- a. Types of TIG torches
- b. Electrode sizes and nozzles
- c. Cylinder construction and care
- d. Regulators and flow meters
- e. Use and care of tooling fixtures
- f. Proper ventilation and purging
- g. Safety considerations

4. TIG Welding of Aluminum

- a. Material preparation
- b. Machine settings
- c. Joint set-up
- d. Welding techniques
- e. Clean-up procedures

5. TIG Welding of Stainless Steel

- a. Material preparation
- b. Machine settings
- c. Current characteristics
- d. Welding techniques
- e. Safety considerations

6. TIG Welding of Low Carbon Steel Plate and Pipe

- a. Material preparation
- b. Welding techniques
- c. Type of current
- d. Shielding gases
- e. Safety precautions

7. TIG Brazing Process

- a. Theory of TIG brazing
- b. Braze alloy properties
- c. Preparation for brazing
- d. Types of brazing alloys

8. Introduction to the MIG Process

- a. Types of MIG torches
- b. Construction of MIG torches
- c. Current characteristics
- d. Advantages and limitations
- e. Safety precautions

9. Welding joints and Terminology

- a. Types of joints
- b. Types of welds
- c. Definitions
- d. Welding nomenclature

Application

1. TIG Welding of Aluminum

- a. Deposit beads on plates
- b. Butt joint-flat
- c. Butt joint-horizontal
- d. Butt joint-vertical
- e. Tee joint-flat
- f. Tee joint-vertical
- g. Lap joint-flat
- h. Lap joint-vertical
- i. Butt joint-overhead

2. TIG Welding of Stainless Steel

- a. Deposit heads on plate
- b. Butt joint-flat
- c. Butt joint-horizontal
- d. Butt joint-vertical
- e. Tee joint-flat
- f. Tee joint-vertical
- g. Lap joint-flat
- h. Lap joint-vertical
- i. Butt joint-overhead

3. TIG Welding of Carbon Steel

- a. Deposit beads on plates
- b. Butt joint-flat
- c. Butt joint-horizontal
- d. Butt joint-vertical
- e. Tee joint-flat
- f. Tee joint-vertical
- g. Lap joint-flat
- h. Lap joint-vertical
- i. Butt joint-overhead
- j. Butt joint 4 inch sch. 40 pipe-horizontal

4. MIG Welding Carbon steel

- a. Deposit beads on scrap plates
- b. Butt joint-flat
- c. Butt joint-vertical up
- d. Butt joint-vertical down
- e. Tee joint-vertical up
- f. Tee joint-vertical down
- g. Butt joint-overhead
- h. Butt joint 6" sch. 40 pipe-horizontal
- i. Butt joint 6" sch. 40 pipe-vertical

All of the welds, except the pipe welds are to be made on 1/8", 3/16", and 3/8" carbon steel plates.

5. Miscellaneous TIG Welding and Braze Welding Processes

- a. Braze weld carbon steel
 - b. Braze weld copper
 - c. Weld cast iron
 - d. Weld aluminum castings
 - e. Weld pot metal
- g. Ability to read blue prints to build structures of welded parts from blue prints

1. Meaning of views and lines

- a. Meaning of lines
- b. Views of an object
- c. Visualization by projection
- d. Visualization by sketching
- e. Sectional views
- f. Material symbols
- g. Auxiliary views

2. Size Description

- a. Units of measurement
- b. Location of dimensions
- c. Limits and tolerances
- d. Dimensional expressions
- e. Finish marks
- f. Auxiliary

3. Welding Print Format

- a. Title block
- b. Sizes of prints
- c. Drawing numbering system
- d. Revision block
- e. Yoning of drawings
- f. Dash numbers

4. Threaded Fasteners

- a. Types of threads
- b. Thread classes
- c. Thread representation
- d. Designating threaded fasteners

5. Types of Fabrication Prints

- a. Detail drawings
- b. Fabrication detail drawings
- c. Assembly drawings
- d. List of materials and parts list

III. SUPPLIES AND EQUIPMENT

Practical Problems in Mathematics for Welders. Published by Delmar:
Albany, New York 12205

Hobart Pocket Guide

Metals and How to Weld Them: T.B. Jefferson and Gorham Woods.
The James F. Lincoln Arc Welding Foundation: Cleveland, Ohio

Welding Technology: J.W. Giachineo, W. Weeks, and G.S. Johnson
American Technical Society: Chicago, Illinois, 60637

Blueprint Reading for Welders. A.E. Bennet and L.J. Siy. Delmar
Publishers Inc. Albany, New York

CURRICULUM
FOR
ELECTRONICS

STIP II

Los Angeles Trade-Technical College
Los Angeles Community College District

CURRICULUM
FOR
ELECTRONICS
STIP II
LOS ANGELES TRADE-TECHNICAL COLLEGE
LOS ANGELES COMMUNITY COLLEGE DISTRICT

I. TRAINING OBJECTIVES

- a. Knowledge of mathematic fundamentals for electronics
- b. Knowledge of safety practices and procedures
- c. Knowledge of fundamentals of AC and DC
- d. Application of AC and DC fundamentals
- e. Knowledge of principles of semi-conductors, tubes and electronic circuit theory
- f. Application of principles of semi-conductors, tubes and electronic circuit theory
- g. Knowledge of and application of fundamentals of physics
- h. Knowledge of and application of computers and computer programming

II. TRAINING ACTIVITIES	APPROXIMATE NUMBER OF HOURS 36	STAFF RESPONSIBLE Instructor
a. Knowledge of mathematic fundamentals for electronics		
1. Arithmetic review fractions and decimals		
2. Simple equations		
3. Solving Equations		
4. Fractional Equations		
5. Ratio and Proportion		
6. Simultaneous equations		
7. Review DC Math		
8. Trig. Functions		
9. Evaluations		
10. Trig. Problems		
11. Math for Inductance		
12. Pythagorean Theorem		
13. Vector Algebra		
14. Math for Capacitance		
15. Vector Algebra		
16. Vector Algebra		
17. Logarithms		
18. Evaluation		
b. Knowledge of safety procedures and practices		continuous Instructor
c. Knowledge of fundamentals of AC and DC	40 hours	Instructor
1. Introduction to Electricity		
2. Ohm's Law		
3. Series Circuits		

4. Parallel Circuits
5. Kirchhoffs Laws-Network Theorems
6. DC Meters
7. Electromagnetic Induction
8. Series-Parallel Circuits
9. Introduction to AC
10. Inductive Reactance
11. Inductive Circuits
12. Capacitive Reactance
13. Capacitive Reactance
14. Capacitive Circuits
15. Alt. Current Circuits
16. Resonance

	<u>APPROXIMATE NUMBER OF HOURS</u>	<u>STAFF RESPONSIBLE</u>
d. Application of AC and DC fundamentals	40	
1. EXPT. 1,2,3 Report Writing		
2. EXPT. 4,5,6 Report Writing		
3. EXPT. 7,8,9 Report Writing		
4. EXPT. 10,11,12 Report Writing		
5. EXPT. 13, 15 Report Writing		
6. EXPT. 15, 16 Report Writing		

7. EXPT. 17
Report Writing
8. EXPT. 18
Report Writing
9. EXPT. 19,20
Report Writing
10. EXPT. 21,22,23
Report Writing
11. EXPT. 24,25
Report Writing
12. EXPT. 26,27,28
Report Writing
13. EXPT. 29,30,31
Report Writing
14. EXPT. 32,33
Report Writing
15. EXPT. 37,38
Report Writing
16. EXPT. 39,45,46
Report Writing
17. EXPT. 40,41
Report Writing
18. EXPT. 42
Report Writing

	<u>APPROXIMATE NUMBER OF HOURS</u>	<u>STAFF RESPONSIBLE</u>
e. Knowledge of principles of semi-conductors, tubes and electronic circuit theory	120	Instructor

Semi conductor principles, diodes, vacuum tubes, diodes-limiters
and clippers

Rectifiers and power supplies; Zener diodes

Filters, Voltage Multipliers

Bipolar Junction Transistors S.C.R.
 Transistor Handling Techniques and Testing
 Transistor Configurations - C.E., C.B., C.C.
 Transistors Amplifiers-OSC
 Amplifier Testing
 Differential and Operational AMPS
 Integrated Circuits
 Vacuum Tubes
 Vacuum Tubes Amplifier-OSC
 Junction Field Effect Transistor J.J.T.
 Mosfets
 Basic Receiver
 Basic Digital Circuits
 Basic Digital Circuits
 Review

		APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
f.	Application of principles of semiconductors, tubes and electronic circuit theory	60	Instructor
	Experiment no. 1,2,3,4,5		
	" " 6,7,8,9,10,11		
	" " 12,13,14		
	" " 15,16,17		
	" " 18,19		
	" " 19,20,26,27		
	" " 31,32,33,34,36,37,38		

Experiment no.	28,29,30
"	" 39,40,41,42
"	" 40,41,42,43
"REVIEW "	40,41,42,43
"	" 54,55,63
"	" 48,52,53
"	" 50,53
"	" 49,52,57,58,69
"	" 61,62,64
"	" 65,66,67

	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
g. Knowledge and application of fundamentals of physics	120	Instructor
1. Introduction, metric system, calculations for Laboratory Reports		
2. Metric Measurements and Resistivity		
3. Density		
4. Magnetic Fields		
5. Magnetic Strength vs. Distance and Current		
6. Magnetic Field in an Air Core Coil		
7. Electromagnetic Induction		
8. Transformer		
9. Review and evaluation		
10. Static Electricity		
11. Plotting Electric Fields		

12. Effect of Distance, area and Dielectric on Capacitance
13. Electric Motors
14. Vectors and Trigonometry
15. Free Fall
16. Hooke's Law
17. Review
18. Evaluation
19. Thermocouples and thermistors
20. Resistance of conductors and semi-conductors vs. temperature
21. Thermal Expansion
22. Specific heat
23. Mechanical equivalent of heat
24. Electrical equivalent of heat
25. Thermal conductivity
26. Index of refraction
27. Review and Evaluation
28. Speed of sound
29. Photometry-Calibration of Opto Electronic devices
30. Simple pendulum
31. Friction
32. Force table-translations equilibrium
33. Levers-Rotational equilibrium
34. Ballistic pendulum I & II
35. Review
36. Final Evaluation

	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
h. Knowledge of and application of computers and computer programming	120	Instructor
1. Introduction-Overview of Technology		
2. Data Structures		
3. Function Types		
4. Architecture		
5. Numeration		
6. Arithmetic		
7. Problem Solving Methods		
8. Instruction Sets		
9. Central Processor		
10. Memory		
11. Peripherals		
12. Bus Structures		
13. Input/Output		
14. File Structures		
15. Software		
16. Languages		
17. Language Processors		
18. Operating Systems		
19. Terminal Operation		
20. Use of APL		
21. APL Exercises		
22. APL Application I		
23. APL Application II		

- 24. Simulation I
- 25. Simulation II
- 26. Machine Language Simulation I
- 27. Machine Language Simulation II
- 28. Machine Language Program I
- 29. Machine Language Program II
- 30. Assembly Language Program I
- 31. Assembly Language Program II
- 32. Application Program I
- 33. Application Program II
- 34. Application Program III
- 35. Application Program IV
- 36. Application Program V

III. SUPPLIES AND EQUIPMENT

Basic Mathematics for Electricity and Electronics. Bertrand B. Singer. McGraw-Hill Book Company. Third Edition.

Basic Mathematics for Electronics. 4th Edition. Cooke and Adams.

Basic Electronics. Bernard Grob. McGraw-Hill Book Company. 4th Edition.

Basic Electricity: A Text-Lab Manual. Paul B. Zbar. McGraw-Hill Book Company. 4th Edition.

Fundamentals of Solid State Electronics. Pascoe. McGraw-Hill. 1st Edition.

Fundamental Concepts of Modern Physics. S.R. Diamond. Amsco School Publications, Inc. 1970.

Electronics: principles and circuits. W.E. Long and P.L. Evans

IBM Student Text. IBM Group. IBM Current

Introduction to Programming. No Author. Digital Publishing Co. Current edition.

CURRICULUM
FOR
MACHINE OPERATOR

STIP II

Los Angeles Trade-Technical College
Los Angeles Community College District

CURRICULUM
FOR
MACHINE OPERATOR
LOS ANGELES TRADE-TECHNICAL COLLEGE
LOS ANGELES COMMUNITY COLLEGE DISTRICT

I. TRAINING OBJECTIVES

- a. Knowledge of mathematic fundamentals and ability to apply to machinist work.
- b. Ability to interpret, visualize and read blueprints
- c. Understanding of the principles and operation of drill press, engine lathe, milling machine, power hack saw, metal band saw, shapers and grinders.
- d. Understanding and application of pulley and gearing speeds, quick change gear application, levers, friction drives, tapping, the ending, hand filing, hand sawing, scraping and free hand grinding.
- e. Application of lathes, mills, contour band saw, shaper and grinders.

II. TRAINING ACTIVITIES

APPROXIMATE
NUMBER OF HOURS
120 hours

STAFF
RESPONSIBLE
Instructor

- a. Knowledge of mathematic fundamentals and ability to apply to machinist work
 - A. Beginning Shop Mathematics
 - 1. Basics of whole numbers
 - a. The number line
 - b. Addition, subtraction, multiplication, division
 - B. Properties of Fractions
 - 1. Formation of fractions
 - a. Least common denominator
 - b. Addition and subtraction of fractions
 - c. Multiplication of fractions
 - 1. Cancellation
 - d. Division of inversion rule
 - 1. Divisor inversion rule
 - C. Using Decimals and Decimal Fractions
 - 1. The Pythagorim Theorum
 - a. Even square roots of whole numbers
 - b. Inexact square root
 - c. Factoring square roots
 - d. Square root of fractions
 - D. Using Tapers in the Machine Shop
 - 1. Calculating tapers
 - a. For the offset tailstock
 - b. For the taper attachment
 - c. For the compound rest
 - E. Understanding Percent
 - 1. Changing percent to decimals
 - 2. Changing percent to fractions
 - 3. Ratio, proportion and percent
 - 4. The rate and the base
 - F. Working with Equations
 - 1. Algebraic expressions
 - 2. Signs of operation
 - 3. Finding the value of numerical and literal expressions
 - 4. Addition, subtraction, multiplication and division of literal and numerical terms
 - 5. Substitution of numerical terms into formulaes

G. Applied Algebra

1. Algebraic expressions
2. Signs of operation
3. Adding like and unlike terms
4. Subtracting like and unlike terms
5. Multiplication of numerical terms
6. Rules of exponents
7. Solving simple equations
8. Simultaneous equations

H. Indexing Calculations, Plain and Angular

1. Rapid indexing
2. Plain indexing
3. Differential indexing
4. Angular indexing

I. Applied Ratio and Proportion

1. The antecedent
2. The consequent
3. Inverse ratio
4. Reducing ratio to lowest terms
5. Proportion
6. Averages

J. Applied Geometry

1. Types of triangles
2. Special triangles
3. Quadrilateral
4. Parallelogram
5. Rectangle
6. Square
7. Trapezoid
8. Polygon
9. Hexagon
10. Area, segment, sector of circles
11. Ellipse
12. Tangent lines
13. Volumes
14. Sphere
15. Frustrums, pyramids, and cones

K. Advanced Screw Thread Calculation

1. Sharp V, Unified threads
2. Thread definitions
3. Major and minor diameters
4. Pitch diameter
5. American National screw threads
6. Thread depths
7. Tap drill sizes
8. Three wire method
9. Square and Acme threads
10. Internal and external threads

L. Basic Metric

1. Use of conversion charts
2. Calculation of values
3. Practical applications

	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
b. Ability to interpret, visualize and read blueprints	120 hours	Instructor
1. The Origination and the Development of a Blueprint		
A. Blueprints for the Machine Shop		
1. From design to blueprint to product		
2. Glossary of terms		
3. Common abbreviations		
B. From Blueprint to Visualization		
1. Three view drawings		
2. Projection		
3. Understanding the various views		
a. View selection		
4. Orthographic views		
5. Isometric views		
a. Sketching techniques		
6. Complete visualization		
C. Reading the Working Drawing		
1. Alphabet of lines		
2. Methods of dimensioning		
3. Notes and symbols		
D. Interpreting Supplementary Information		
1. Scaling and dimensioning		
2. Holes, fillets, and rounds		
3. Title block		
4. Bill of materials		
5. Alterations and revisions		
E. Special Views		
1. Section views		
2. Auxiliary views		
3. Oversize and undersize views		
F. Assembly Drawings		
1. Phantom lines		
2. Mold lines		
3. Hatching lines		

G. Gearing Drawings

1. Special notations
2. Formulas

H. Interpretation of Blueprints

1. Symbols and standards
2. The necessity of miltiview projection
3. The reason for scale on prints
4. Clarity and effective dimensioning
5. The part print
6. Assembly blueprints

I. One, Two, and Three View Projections

1. Complete and effective use of one view
2. When are two or three views necessary?
3. The type of part that requires multifiew projection
4. Checking for print completeness
5. The box method
6. Sample prints to illustrate effective blueprint reading

J. Sectional Views

1. Types of section drawings
2. Partial sections
3. Locating cutting planes
4. Test on section sketching

K. Allowances and Tolerances

1. An explanation of the difference between tolerance and allowance.
2. Standard practices A.S.A.
3. Limits and fits
4. Basic dimensions
5. Unilateral tolerance
6. Bilateral tolerance
7. Application of tolerances and allowances
8. Dual dimensioning - decimal and metric

	APPROXIMATE NUMBER OF HQURS	STAFF RESPONSIBLE
c. Understanding of the principles and operation of drill press, engine lathe, milling machine, power hack saw, metal band saw, shapers and grinders	240	Instructor

A. Elementary

- Principles:
- A. Machine Tool Safety
 - B. Elementary principles of operation of pedestal grinder
 - C. Elementary principles of operation of power saws

- D. Elementary principles of operation of drill press
- E. Elementary principles of operation of engine lathe
- F. Elementary principles of operation of milling machine

B. Elementary

- Application:
- 1. Off-hand grind drills for various metals
 - 2. Drill holes to a layout
 - 3. Countersink counter bore and spotface holes
 - 4. Drill holes at an angle
 - 5. Drill holes using jigs
 - 6. Machine Tap holes
 - 7. Machine Ream holes
 - 8. Grand tool bits for lathe work and other applications
 - 9. Single tool thread on the lathe
 - 10. Center, face and straight turn on the lathe
 - 11. Center, face and taper turn on the lathe
 - 12. Use a cut off tool on the lathe
 - 13. Knurl on the lathe
 - 14. Use indicators, micrometers and gages
 - 15. Machine work help in four jaw chuck
 - 16. Machine work help in three jaw chuck
 - 17. Mill a flat surface
 - 18. Mill using the index head
 - 19. Mill using a side milling cutter
 - 20. Mill using a slotting cutter
 - 21. Mill using a fly cutter
 - 22. Mill angular surfaces
 - 23. Operate both vertical and horizontal mills

C. Bench

- 1. Use of precision tools for layout
- 2. Layout procedures
- 3. Practical purposes of layout

D. Lathe

- 1. Grind lathe tools
 - a. Using the roughing wheel
 - b. Using the finishing wheel
 - c. Checking the cutting angles
 - d. Grind carboloy tools
- 2. Speeds and feeds
- 3. Holding devices and how to use each
- 4. Special holding devices
 - a. Face plates
 - b. Soft jaws
 - c. Production setups

5. Turn work on a mandrel
 - a. Checking center alignment
 - b. Tailstock lubrication
 - c. Correcting center
 - d. Placing the mandrel in the part
6. Tapers
 - a. Using the tailstock offset
 - b. Using the taper attachment
 - c. Using the compound rest
7. Threads
 - a. Cutting external threads
 - b. Compound setting
 - c. Cutting internal threads
 - d. Using the chasing dial
 - e. Using the thread stops
 - f. Thread formulas
 - g. Pipe threads
 - h. Thread angles
 - i. Preparing the part for the threading operation
 - j. Checking of threads with gages, wires, pitch micrometers
8. Lathe attachments
 - a. Carriage stops - micrometer, travel indicators
 - b. Turrets
 - c. Carriage turrets and quick change holders (K.D.K.), etc.
 - d. Taper attachments
 - e. Steady rest
 - f. Follower rest
9. Gear train mathematics
10. Gear changes for metric conversion of lathe

E. Mill

1. Speeds and feeds
2. Holding devices
 - a. Vise
 - b. Strap clamps
 - c. Use of angle plates
 - d. Dividing heads
 1. Angular machining
 2. Bolt hole circles
 3. Odd shaped figures
 - e. Rotary table
 - f. V-Blocks
3. Mill a woodruff keyway
 - a. Preparing the setup
 - b. Setting the depth
 - c. Checking the keyway
4. Using an index head
 - a. Checking the head ratio
 - b. Setting the sector arm
 - c. Selecting the correct index plate
 - d. Cutting a spur gear
 - e. Cutting a helix

5. Straddle and gang milling
 - a. Using the correct spacing for straddle milling
 - b. Lubricating the cutters
 - c. Setting up the gang mills
 - d. Checking feeds and speeds for effective cutting

F. Grinder

1. Wheels and types
2. Types and styles of grinders
3. Dress a grinding wheel
 - a. Using a hand dresser
 - b. Dressing applications
 - c. Cylindrical and surface grinder
4. Grind parallel surfaces
 - a. Using the surface grinder
 - b. Setting the part on the machine
 - c. Using the magnetic chuck
 - d. Grinding non-magnetic parts

	APPROXIMATE NUMBERS OF HOURS	STAFF RESPONSIBLE
d. Understanding and application of pulley and gearing speeds, quick change gear application, levers, friction drives, tapping, ending, hand filing, hand sawing, scrapping and free hand grinding	240	Instructor

A. Single Points Cutting Tools

1. Types of tools
2. Cutting tool angles
3. Tool holders
4. Types of tool holding devices

B. Stock Removal

1. Friction and heat
2. Feeds and speeds
3. High speed tools
4. Carboloy tools
5. Ceramic tools
6. Production methods
7. Photo-type challenges

C. Grinding Wheels

1. Safety
2. Grinding theory
3. Abrasives
4. Wheel identification
5. Types of wheels
6. Theory of stock removal by grinding
7. Grinding finishes

- D. Small Hand Tools
 - 1. Nomenclature
 - 2. Hammers and punches
 - 3. Screw drivers and wrenches
 - 4. Clamps and Vises
 - 5. Files and Scrapers
 - 6. Hacksaws and sawing operations
 - 7. Chisels and chipping
- E. Use of Measuring Tools
 - 1. Semi-precision measuring tools
 - 2. Precision measuring tools
 - 3. Indicators and their use
- F. Surface Finish and Measurement
 - 1. Measurement of surface roughness
 - 2. Surface finish measuring instruments
- G. Heat Treatment and Testing of Metals
 - 1. The spark test
 - 2. Heat treatment of steel
 - 3. Surface hardness testing (Rockwell-Brinell)
 - 4. Steel Classification

	<u>APPROXIMATE NUMBERS OF HOURS</u>	<u>STAFF RESPONSIBLE</u>
e. Application of lathes, mills, contour band saws, shapers and grinders	240	Instructor
A. Applied Machine Shop Physics		
Action of Cutting Tools Materials		
1. Back rake angle		
2. Side rake angle		
3. End relief angle		
4. Side relief angle		
5. Side cutting edge angle		
6. End cutting edge angle		
7. Cutting tool materials		
B. Cutting Action of Tool When Cutting Dry		
1. Excessive heat		
2. Softening of cutting tools		
3. Metallic buildup		
C. Cutting Action Using Coolant		
1. Heat transfer		
2. Chip disposal		
3. Cutting tool life		
4. Lubrication		
5. Metallic buildup		
6. Surface finish		

- D. Cutting Action Using Lubricant
 - 1. Lubricating qualities of cutting fluids
 - 2. Use of cutting fluids
 - 3. Tool life
 - 4. Life of cutting fluids
 - 5. Hazard of cutting fluids
- E. Selection of Speed and Feed
 - 1. Factors affecting speeds and feeds
 - 2. Calculation of speeds and feeds
 - 3. Material hardness
 - 4. Depth of cut
 - 5. Amount of feed
 - 6. Cutter material
 - 7. Job configuration
 - 8. Surface finish
 - 9. Coolants
 - 10. Conventional and climb milling
- F. Principles of Levers and Cams
 - 1. Types of levers
 - 2. Rotation about fulcrum
 - 3. Calculation (levers)
 - 4. Types of cams
 - 5. Cam motions
 - 6. Calculations (cams)
- G. Principles of Pulleys and Gears
 - 1. Types of pulleys
 - 2. Types of belts
 - 3. Speed limitations
 - 4. Pulley calculations
 - 5. Types of gears
 - 6. Gear materials
 - 7. Gear calculations, ratios
 - 8. Checking size
 - 9. Calculating speeds
- H. Identification of Metals
 - 1. Means of identification
 - 2. Spark test
 - 3. Color codes
 - 4. Laboratory analysis
- I. S.A.E. Specifications
 - 1. Reading S.A.E. numbers
 - 2. Composition

- J. Carbon Content of Steel
 - 1. Reading identification numbers
 - 2. Composition of alloys
 - 3. Low and high carbon alloys
- K. Visual Indications of Temperature
 - 1. Color changes
 - 2. Temperature versus color
 - 3. Temperature sticks
- L. Forging
 - 1. Drawing, drawing out
 - 2. Spreading
 - 3. Upsetting
 - 4. Welding
 - 5. Bending, heading, twisting
- M. Simple Furnace Operation
 - 1. Proper mixture
 - 2. Lighting furnace
 - 3. Use of tongs
- N. Characteristics of Metals
 - 1. Brittleness
 - 2. Toughness
 - 3. Ductility
 - 4. Machinability
 - 5. Finish
- O. Heat Treatment of Steels
 - 1. Normalizing
 - 2. Annealing
 - 3. Hardening and tempering
 - 4. Theory
 - 5. Case hardening and pack hardening
 - 6. Hardness testing

III. SUPPLIES AND EQUIPMENT

Applied Math for Technicians. Claude S. Moore, Bennke L. Griffin,
Edward C. Polhamus

Machine Trades Blueprint Reading, Sixth Edition. Russel W. Ihne,
Walter E. Streeter, American Technical Society. Chicago,
Illinois 60636

Shop Theory, Sixth Edition. James Anderson, Earl E. Tatro,
McGraw Hill, Inc.

Machine Shop Syllabus

CURRICULUM
FOR
AUTOMATIC VENDING MACHINE ROUTE PERSON
STIP II

Los Angeles Trade-Technical College
Los Angeles Community College District

CURRICULUM
FOR
AUTOMATIC VENDING MACHINE ROUTE PERSON
STIP II
LOS ANGELES TRADE-TECHNICAL COLLEGE
LOS ANGELES COMMUNITY COLLEGE DISTRICT

I. TRAINING OBJECTIVES

- a. Knowledge of the proper selection and efficient use of hand tools for vending machine repair and maintenance
- b. Knowledge of mathematic fundamentals applied to Automatic Vending Machines
- c. Understanding of and application of brazing, soldering and welding of flat, vertical, horizontal and overhead welds on high and low alloy steels
- d. Understanding and application of disassembling and reassembling general merchandising vending machines
- e. Ability to read and interpret schematics, drawings and blueprints
- f. Understanding of electronic principles applied to automatic vending machines
- g. Understanding of principles of coin and currency devices
- h. Understanding of food vending machines
- i. Understanding of beverage vending machines
- j. Understanding and application of vending machine refrigeration principles
- k. Understanding and application of beverage and food heating methods
- l. Knowledge of principles of applied physics of vending
- m. Knowledge of public health and sanitation laws, regulations and procedures
- n. Knowledge of principles of transportation for automatic vending
- o. Ability to evaluate and estimate repair work
- p. Knowledge of job employment, customer and worker relations

II. TRAINING ACTIVITIES

	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
a. Knowledge of proper selection and efficient use of hand tools for vending machine repair and maintenance	20	Instructor
1. Proper Selection of Tools		
A. History of hand tools		
B. Types of tools		
2. Proper use and care of tools		
A. Safety		
B. Preservative maintenance		
b. Knowledge of mathematic fundamentals	20	Instructor
1. Beginning Mathematics		
Basic whole numbers		
a. The number line		
b. Addition, subtraction, multiplication, division		
2. Properties of fractions		
Formation of fractions		
a. Least common denominator		
b. Addition and subtraction of fractions		
c. Multiplication of fractions		
1. cancellation		
d. Division of fractions		
1. divisor inversion rule		
3. Using decimals and decimal fractions		
The Pythagorean Theorum		
a. Even square roots of whole numbers		
b. Inexact square root		
c. Factoring square roots		
d. Square root of fractions		
c. Understanding of and application of brazing, soldering, and welding of flat, vertical, horizontal and overhead welds on high and low alloy steels	40	Instructor
1. Introduction to Shop Practices		
a. Explanation of shop practices		
b. Shop safety		
2. Operation and Care of Equipment		
a. Explanation and demonstration of equipment		
b. Proper care of equipment		
c. Flame adjustment		

3. Joints, Position and Metal Thickness

4. Welding in Flat Position

- a. Flat head on 3/16 plates
- b. Flat butt welds 3/16 plates
- c. Flat butt welds 1/3 plates
- d. Horizontal fillet weld 3/16 plate
- e. Light gauge sheet

5. Welding in Vertical Position

- a. Square edge butt 3/16 plate
- b. Filled 3/16 plate
- c. Lap weld 3/16 plate
- d. Butt weld 1/4 plate with 600 included angle
- e. Fillet weld 1/4 plate
- f. Lap weld 1/4 plate

6. Welding in Horizontal Position

- a. Butt weld 3/16" plate
- b. Butt weld 1/4 plate
- c. Butt weld 1/4" plate (top plate bevel)

7. Overhead Welding

- a. Butt weld 3/16" plate
- b. Lap weld 3/16" plate
- c. Butt weld 1/4" plate

	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
d. Understanding and application of disassembling and assembling general merchandising vending machines	140	Instructor

1. Operating Principles

- a. Introduction
- b. Types by product
- c. Types by operation

2. Component Functions

- a. Merchandising
- b. Product Knowledge

3. Correct Settings

- a. Use of gram scale for hot beverage machines
- b. Use of refractometer and graduates for cold beverage machines
- c. Price settings

4. Disassemble Malfunctions

- a. Coin Mechanism
- b. Cup Mechanism
- c. Delivery systems

5. Repair and Maintenance		
a. Preventative maintenance		
b. Mechanical repairs		
c. Electrical repairs		
6. Trouble shooting		
a. Mechanical		
b. By use of schematics		
e. Ability to read and interpret schematics, drawings and blueprints	APPROXIMATE NUMBER OF HOURS 60	STAFF RESPONSIBLE Instructor
1. Introduction to Coin Mechanism		
a. Safety		
b. ABC's of hand tools		
c. Breakdown and assembly of coin machines		
2. Introduction to Changers		
a. Safety		
b. Breakdown and assembly of changers		
3. Introduction to Basic Circuitry		
a. Tracing out color coded circuits		
b. Pictorial drawings		
c. Exploded views		
d. Elementary troubleshooting		
4. Electric Cigarette Machines		
a. Rowe circuitry and troubleshooting		
b. Vendo circuitry and troubleshooting		
c. Smokeshop circuitry and troubleshooting		
d. Seaburg circuitry and troubleshooting		
5. Beverage Machines		
a. Westinghouse circuitry and troubleshooting		
6. Final Examination		
7. Field Trip (to be announced)		
f. Understanding of electronic principles applied to automatic vending machines	APPROXIMATE NUMBER OF HOURS 60	STAFF RESPONSIBLE Instructor
1. Introduction to Electricity in Vending		
a. History of Vending		
b. Trade Terminology		
c. Electricity and safety		

2. Matter and Energy
3. Basic electrical Quantities
 - a. Voltage
 - b. Current
 - c. Resistance
4. Ohm's Law
5. Factors affecting Voltage and Current
 - a. Series circuits
 - b. Parallel circuits
 - c. Kirchhoff's Laws
6. Magnetism and Electromagnetism
 - a. Magnets
 - b. Magnetic Fields
 - c. Attraction and repulsion
 - d. Ohm's Law for magnetic circuits
 - e. Permeability
 - f. Flux Density
 - g. Hysteresis
7. Wiring Devices
 - a. Electrical distribution
 - b. Electrical faults
 - c. Fuses
 - d. Current breakers
8. Electrical Wiring
 - a. Current carrying capacities
 - b. Measurements of wires
 - c. Resistivity
 - d. Insulation and conductors
 - e. Gages
 - f. Outlets and plugs
 - g. Polarity
9. Switches and Contacts
 - a. Switch types
 - b. Anatomy of switch
 - c. Switch limitations
 - d. Automatically-actuated switches
 - e. Micro switches
 - f. Other switches
10. Coils, Relays, and Solenoids
 - a. Coils
 - b. Relays
 - c. Solenoids
 - d. Transformers

11. Power and Heating Effects
 - a. Principles of resistance heating
 - b. Product heaters
 - c. Motor overload switch heaters
 - d. Maintenance
 - e. Shorted band heaters
 - f. Faulty heater in hot food units
 12. Electrodes
 - a. Description
 - b. Testing
 - c. Application in hot and cold beverage machines
 13. Electrical Test Equipment
 - a. Basic meter principles
 - b. The ammeter
 - c. The voltmeter
 - d. The Ohmmeter
 14. Capacitance, Induction, and Rectifiers
 - a. Capacitance
 - b. Capacitance and resistance
 - c. Induction and self induction
 - d. Rectifiers
 - e. Alternating and direct current
 15. Final Examinations
 16. Field Trips (To be announced)
- | | <u>APPROXIMATE
NUMBER OF HOURS</u> | <u>STAFF
RESPONSIBLE</u> |
|--|--|------------------------------|
| g. Understanding of and application of principles of coin and currency devices | 200 | Instructor |
1. Nomenclature
 - a. Introduction
 - b. Safety
 - c. Hand Tools
 - d. Trade terminology
 2. Acceptors and Rejectors
 - a. Disconnect and reassemble national rejector
 - b. Disassemble and reassemble coin acceptor
 3. Changers
 - a. Disassemble
 - b. Wiring
 - c. Testing

4. Steppers and accumulators
 - a. Types
 - b. Application
 - c. Maintenance
 5. Electrical
 - a. Beverage equipment
 - b. Food equipment
 - c. Merchandise equipment
 6. Repair and Maintenance
 - a. Adjustments
 - b. Preventative maintenance
 7. Disassembling and Reassembling
 - a. Side plates
 - b. Acceptors
 - c. Rejectors
 - d. Steppers
 - e. Accumulators
 8. Adjustment Procedures
 - a. Mechanical
 - b. Electrical
 9. Electrical Applications
 - a. Vending Machines
 - b. Currency devices
- | | <u>APPROXIMATE
NUMBER OF HOURS</u> | <u>STAFF
RESPONSIBLE</u> |
|--|--|------------------------------|
| h. Understanding of food vending machines | 120 | Instructor |
| 1. Introduction | | |
| 2. Types by product <ol style="list-style-type: none"> 1. Age dating | | |
| 3. Delivery Systems | | |
| 4. Coin Mechanisms | | |
| 5. Repair Maintenance <ol style="list-style-type: none"> 1. Repair Manuals 2. Disassembly and Assembly | | |
| 6. Preventative Maintenance | | |
| 7. Troubleshooting | | |
| 8. Proper Installation | | |

1. Understanding of beverage vending machines

1. Cup dispensing

1. Hot cups
2. Cold cups

2. Refrigeration

1. Troubleshooting
2. Ice Machines
 - a. Common faults
 - b. Electrical
 - c. Mechanical

3. Liquid Principles

1. Pumping
2. Draining
3. Brewing
4. Setting Portions

4. Disassembly and Assembly

1. External
2. Internal

5. Installation

6. Coin Mechanisms

7. Repair Manual Study

APPROXIMATE
NUMBER OF HOURS
200

STAFF
RESPONSIBLE
Instructor

j. Understanding of and application of vending machine refrigeration principles

1. Thermodynamics

- a. History of Thermodynamics as Applied to Vending Refrigeration
- b. Application Heat Ethalpy Chart BTU/lb
- c. Latent Heat, Effective Heat, Superheat
- d. Charles Law, Boyles Law
- e. Change of state, liquid to gas, gas to liquid three forms of changes
- f. Movement of heat, from hottest to cooler area, by conduction or convection

2. Refrigeration Components

- a. Compressors - types reciprocal, rotary, centrifugal
- b. Controls - cap tube, A.E.V.
- c. Evaporators - evaporator pasts
- d. Condensors - static - dynamic
- e. Accessories - driers, filters, defrost by-passes

3. Trouble Shooting
 - a. Locating the problem
 - b. Decide on proper solution, time, cost, parts availability
 - c. Complete repairs
 - d. Testing all covered on previous areas
 4. Components
 - a. Describe construction and functions of a hermetic compressor allowing student to view lab unit
 - b. Describe construction and functions of an evaporator and an evaporator post using lab unit
 - c. Describe construction and function of a condensor - both static and dynamic
 - d. Describe the construction and function of the minor components which put into their proper perspective serve to tie the major components into a complete functional system
 - e. Components and functions are explained as students operate laboratory machines
 5. Testing and Exchanging Units
 - a. Check the functions of the respective hermetic compressor for proper operating pressures
 - b. Remove compressor from system by use of proper procedures
 - c. Reinstall compressor using proper procedures, i.e., silver soldering fitting, evacuating the system, and test under lab conditions
 6. Exchanging units and components
 - a. Remove entire assembly from machine
 - b. Remove all major components and minor components
 - c. Check each component for function
 - d. Reassemble
 - e. Test
 7. Repair and Maintenance
 - a. Maintenance prevents repairs
 - b. Repairs minor - major costs
 - c. Maintenance of equipment including cleaning condensers, oiling fans removing foreign objects
 - d. Defrost problems
- | | | |
|---|------------------------|--------------------|
| | APPROXIMATE | STAFF |
| k. Understanding and application of beverage and food heating methods | <u>NUMBER OF HOURS</u> | <u>RESPONSIBLE</u> |
| | 60 | Instructor |
1. Electrical heating
 1. Temperature setting
 2. Trouble-shooting

2. Preventative Maintenance		
3. Circuits		
4. Switches		
5. Thermostats		
6. Fuses and circuit breakers		
7. Controls		
8. Removal and Installation	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
1. Knowledge of principles of applied physics of vending	60	Instructor
1. Refrigeration principles		
a. Freezers		
b. Coolers		
c. Air conditioning		
2. Molecular theory		
3. Nature of Heat		
a. Heat transfer		
b. Producing methods		
c. Measuring and Controlling		
4. Thermal Expansion		
Physics Laboratory Basics		
a. Use of large equipment		
b. Use of small equipment		
5. Leverage Principles	APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
m. Knowledge of public health and sanitation laws, regulations and procedures	20	Instructor
1. Public Health Codes		
a. NAMA public health regulations		
b. NAMA equipment compliance code		
c. University of Indiana Test Lab		
2. Health Department Inspectors		
a. Authority		
b. Responsibility		
c. Manner of operation		
d. Location of Public Health department		

3. Food Handling Procedures
 - a. Types of food
 - b. Perishability
 - c. Ingredients
 - d. Consumer containers
 - e. Importance of three T's - Transportation, temperature, time

4. Sanitation Procedures
 - a. Installation procedures
 - b. Daily sanitizing
 - c. Weekly sanitation
 - d. Monthly preservative maintenance and sanitation procedures

5. General Field Sanitation
 - a. Machine location
 - b. Exterior construction and maintenance
 - c. Interior construction and maintenance
 - d. Water supply and disposal
 - e. Delivery of product

6. Shop and Commissary Sanitation
 - a. Personal cleanliness
 - b. Source of supply
 - c. Storage
 - d. Preparation
 - e. Packaging

	<u>APPROXIMATE NUMBER OF HOURS</u>	<u>STAFF RESPONSIBLE</u>
n. Knowledge of principles of transportation for automatic vending	20	Instructor
1. State vehicle code		
2. Safety 1. Defensive driving		
3. Private property regulations		
4. Company regulations		
5. Vehicle maintenance		
6. Vehicle loading 1. Product care 2. Product separation		
7. Cleanliness 1. Vehicle 2. Product		

	<u>APPROXIMATE NUMBER OF HOURS</u>	<u>STAFF RESPONSIBLE</u>
o. Ability to evaluate and estimate repair work	20	Instructor
1. Field Repair		
1. Replacement cost		
2. Time involved		
2. Shop Repair		
1. Replacement cost		
2. Repair cost		
3. Parts availability		
3. Service Manuals		
4. Report Writing		
5. Proper use of available parts suppliers		
p. Knowledge of job employment, customer and work	20	Instructor
1. Industrial Safety Requirements		
1. Safety for installations		
2. Industrial standards		
3. Special facilities		
4. Ventilation		
5. Sanitary facilities		
2. Commercial Procedures		
1. Wages and hours		
2. Provisions for women and minors		
3. Labor codes		
4. Responsibility of the worker		
5. Responsibility of the employer		
3. Trade Ethics		
1. Federal Laws		
2. State Laws		
3. Labor management cooperation		
4. The job personality		
4. Job Orientation		
1. Employer, employee organizations		
2. Personal records		
3. Labor management relations act		
4. Physical factors		

5. Work Habits

1. Physical factors
2. Personal records
3. Evaluating the job
4. Obligation for services
5. Responsibilities

6. Worker Relationships

1. Training and testing
2. Time schedules
3. Reviews and evaluation
4. Personal compromise
5. Benefits to the disabled worker
6. Working conditions

7. Security Clearances

1. Personal
2. Motor vehicle department

III. SUPPLIES AND EQUIPMENT

Books, supplies and equipment to be identified

PROGRAM ACTIVITY/TRAINING PLAN
STIP II

COMPUTER OPERATOR

LOS ANGELES VALLEY COLLEGE
LOS ANGELES COMMUNITY COLLEGE DISTRICT

I. CLASSROOM TRAINING

- A. Instructional Methods
- B. Evaluation of Participants
- C. Plan to Meet Individual Needs
- D. Determination of Job Readiness
- E. Linkages with Job Development and EDP Components

II. CURRICULUM

- A. Training Objectives
- B. Training Activities
- C. Participant Assessment
- D. Equipment, Books and Supplies
- E. Specific Occupational Advisory Group (SOAG)

III. RECORD KEEPING

IV. CALENDAR

COMPUTER OPERATOR
PROGRAM ACTIVITY/TRAINING PLAN
LOS ANGELES VALLEY COLLEGE

STIP II

I. CLASSROOM TRAINING

This program is for those who are intending to enter the field of data processing as a computer operator. The major objective of this course is to insure that the student, under supervision, can effectively operate a modern medium or large computer system. It also will place emphasis on assisting the student in acquiring desirable work habits, attitudes and career awareness. The program is 44 weeks long with approximately 1320 hours.

Lab periods will be closely supervised to assure proper attitudes, procedures, and correct use of equipment.

Time will be provided within the structure of the schedule for participants to seek assistance from the instructor and/or director in reference to training needs. The participants will be evaluated monthly and the employability development plan will be reviewed.

Those participants whose evaluations have indicated a solid comprehension of the subject matter will be further evaluated by the instructor directly responsible for computer operation. The student will be asked to demonstrate his/her ability to:

1. Operate the I/O devices of the computer;
2. Operate the console and communicate with the computer (knowledge of commands) (main frame);
3. Type and keypunch with speed and accuracy.

Those students whose achievements are considered to be high enough will be counseled in preparation for job placement, and job placement activities will be started by the program director and/or the job developer.

The recruiter/developer will establish contacts with business and industry for future placement of participants.

Diagnostic evaluation of skills will be ongoing with definite goals of participant placement in positions of computer operator or a position which will lead to computer operator. Private tutoring will be given, and if the participant is deemed in need of more help than that available within our program, he/she will be encouraged to spend time in the computer lab.

II. CURRICULUM

A. TRAINING OBJECTIVES

Upon successful completion of this course, the student will be able to:

1. Describe the three basic functions of data processing: input, processing, and output.
2. Describe and identify the functional units of an electronic data processing system.
3. Describe, identify and use the following concepts of representing information in an electronic data processing system:
 - a. How binary digits represent data.
 - b. BDC, EBCDIC and ASCII coding system.
4. Describe how data is represented to the computer on data recording media.
5. Describe methods of organizing data in a data processing system.
6. Describe the more commonly used computer programming languages and know the advantages and disadvantages of each of these languages.
7. Describe teleprocessing systems and identify some applications where these systems might be used.
8. Utilize programming techniques by writing computer programs in the BASIC programming language.
9. Demonstrate an understanding of how batch programs are compiled and executed by a computer.
10. Demonstrate an understanding of how computer programs are entered into and executed by a computer utilizing time-sharing terminals.
11. Describe the sequence of operations when a CPU is executing an instruction or a channel is executing a command.
12. Describe the functions of the PSW, system control registers, and interrupts.
13. Demonstrate an understanding of the following subject areas pertaining to operating systems:
 - a. Purpose of an operating system.
 - b. Components of an operating system.
 - c. Interactions between the operating system and production programs.
 - d. Concepts of a virtual storage.
 - e. Components of a paging system.
 - f. Principles of multiprogramming, control programs, and spooling.
14. Demonstrate a basic understanding of the following configurations of Operating Systems: DOS, OS, VS, MVS, and VM.

15. Demonstrate, by successfully completing instructor assigned exercises on a computer, the ability to perform the following tasks:
 - a. Start up a computer system and initiate jobs.
 - b. Properly load, and operate the following I/O devices:
 1. Card Reader
 2. Line Printer
 3. Magnetic Tape Drive
 4. Magnetic Disk Drive
 - c. Issue operator commands and respond to system messages.
 - d. Utilize system service aids used in diagnosing and correcting hardware and software errors.
 - e. Correct format and placement errors in job control and utility control statements.
 - f. Properly use reference manuals and other operator related publications.
 - g. Issue operator commands and respond to messages for a system configured with HASP, JES, or POWER.
16. Demonstrate, by successfully completing instructor assigned exercises on the equipment, the ability to operate the following unit record equipment:
 - a. Card punch machine
 - b. Sorter
 - c. Collator
 - d. Reproducer
 - e. Interpreter
 - f. Separator
 - g. Burster
17. Demonstrate, through a simulated job environment, the ability to conform to the following:
 - a. How to properly complete job applications.
 - b. How to respond to job interviews.
 - c. Punctuality.
 - d. How to work and cooperate with other workers on the job.
 - e. Loyalty to employer.
 - f. Personal appearance.
 - g. Keys to job advancement.

B. TRAINING ACTIVITIES

	<u>APPROXIMATE NUMBER OF HOURS</u>	<u>STAFF RESPONSIBLE</u>
1. Introduction to Data Processing		
A. Definition and purpose		
B. Examples of data-processing systems		
C. History		
2. Functional Operation of Data Processing Systems		
A. Programming		
1. Stored program control		
2. Microprogramming		
B. Functional units		
1. Input		
2. Output		
3. Main Storage		
4. Auxiliary storage		
5. Central processing unit		
C. Purpose and use of EDP-system console		
3. Input/Output Devices		
A. Card Reader		
B. Card Punch		
C. Magnetic-Tape Units		
D. Paper-Tape Readers and Punches		
E. Key-to-Tape Devices		
F. Key-to-Disk Devices		
G. Magnetic-Ink-Character Readers		
H. Optical Readers		
I. Printers		
J. Visual-Display Units		
K. Remote Terminals		
4. Storage Devices		
A. Purpose		
B. Main Storage		
1. Addressing		
2. Core storage		
3. Semiconductor monolithic storage		
C. Auxiliary Storage		
1. Types		
a. Sequential		
b. Direct-access		
2. Magnetic Drum		
3. Magnetic Disk		
4. Data-Cells		
5. Magnetic Tape		

	<u>APPROXIMATE NUMBER OF HOURS</u>	<u>STAFF RESPONSIBLE</u>
5. Input/Output Control System		
A. Purpose		
B. Control units		
C. Channels		
D. Buffers		
E. Functional operation		
F. Auxiliary operations		
6. Central Processing Unit		
A. Purpose		
B. Components		
1. Control Section		
2. Arithmetic and Logic Unit		
C. Registers		
D. Instruction Counter		
E. Adders		
F. Instruction Processing		
1. Instruction definition		
2. Instruction format		
3. Instruction execution		
4. Instruction types		
G. Operations		
1. Serial		
2. Parallel		
3. Fixed-length		
4. Variable-length		
5. Floating Point		
7. Data Representation		
A. Computer Number Systems		
1. Basic concepts		
2. Binary numbering system		
3. Decimal numbering system		
4. Octal numbering system		
5. Hexadecimal numbering system		
6. Number systems conversions		
B. Binary method of notation		
C. Code checking		
1. Parity checks		
2. Fixed-count checks		
D. Coding systems		
1. Binary Coded Decimal (BCD)		
2. Extended Binary Coded Dcimal Interchange Code (EBCDIC)		
3. ASCII and ASCII-8		

	<u>APPROXIMATE NUMBER OF HOURS</u>	<u>STAFF RESPONSIBLE</u>
8. Data Recording Media		
A. Punched Card		
1. Construction		
2. Hollerith Code		
3. 96-column card		
B. Paper Tape		
1. Five-channel		
2. Eight-channel		
C. Magnetic Tape		
1. Description		
2. Seven-track tape		
3. Nine-track tape		
D. Magnetic Ink Character documents		
E. Optical Readable documents		
F. Direct-Access recording Media		
1. Disk		
2. Drums		
3. Data-cells		
G. Visual and Audio outputs		
H. Computer output microfilm		
9. Programming Techniques		
A. Purpose of programs		
B. Methods of programming a computer		
1. Batch processing		
2. Interactive processing		
3. Real Time processing		
C. Program processing		
1. Starting the problem		
2. Flowcharts		
3. Coding the solution		
4. Execution		
5. Debugging		
6. Documentation		
D. Introduction to BASIC programming language		
1. Terminal sign-on procedures		
2. Instruction format		
3. Instructions		
a. READ		
b. DATA		
c. PRINT		
d. LET		
e. GO TO		
f. IF-THEN		
g. END		
4. Program execution on terminals		

- E. Program concepts using BASIC
 - 1. Constants
 - 2. Variables
 - 3. Uncontrolled loops
 - 4. Methods used to control loops
 - a. Counters
 - b. Dummy data values
 - c. Conditional tests
 - 5. Initialization
 - 6. Accumulators
 - 7. Internal sorts
 - 8. Formatting printed outputs
 - a. Page headings
 - b. Column headings
 - c. Detail lines
 - d. Totals and page footings
 - 9. Tables (Arrays)
 - a. Purpose
 - b. Subscripted data items
 - c. Construction
- 10. Programming Languages
 - A. Machine Language
 - B. Assembler Language
 - C. Higher-Level Programming Languages (Description & Use)
 - 1. FORTRAN
 - 2. COBOL
 - 3. BASIC
 - 4. RPG
 - 5. PL/1
 - 6. APL
 - D. Execution of Assembler and Higher-level languages
 - 1. Source program
 - 2. Object program
 - 3. Assembler and compiler programs
 - 4. Program processing
- 11. Computer Files and Data Bases
 - A. File Concepts
 - 1. Definitions
 - a. Item
 - b. Record
 - c. File
 - d. Volume
 - 2. Blocking of Records
 - 3. Volume and File labels
 - 4. Fixed and variable-length files
 - 5. Organization and access methods
 - a. Sequential
 - b. Indexed-sequential
 - c. Random
 - d. Direct

- B. Data Bases
 - 1. Purpose
 - 2. Design
 - 3. Software
 - a. IMS
 - b. DL/1
 - c. TOTAL
 - 4. Advantage

12. Computer Operating Systems

- A. Introduction to standard OS (MFT and MVT)
 - 1. Principles of multiprogramming and control programs
 - 2. Data management facilities
 - 3. Function of the initiator
- B. Introduction to OS/VS
 - 1. Components of a paging system
 - 2. Introduction to virtual storage
 - 3. Dynamic addressing
- C. Introduction to job management
 - 1. Job flow - job stream to final output
 - 2. Concepts of jobs and job steps
 - 3. Function of reader, writer and interpreter
- D. Operating System Configurations
 - 1. DOS
 - 2. OS
 - 3. VS
 - 4. VM
 - 5. MVS

13. Job Control Language and Utilities

- A. Job Control Language
 - 1. Job Statement parameters
 - 2. Execute Statements parameters
 - 3. DD Statement parameters
 - 4. Catalogued and In-Stream procedures
 - a. Overriding
 - b. Parameters
 - c. Reader, writer, initiator procedures
 - 5. Applications using JCL
 - a. Access existing data sets
 - b. Create new data sets
 - c. Find and correct JCL errors indicated by error messages in a JCL listing.
 - 6. Identify JES control statements
- B. Utility Programs
 - 1. Purpose
 - 2. Types
 - 3. Applications

14. System Operation
 - A. Peripheral Device Operation
 1. Card Reader
 2. Printer
 3. Tape Drive
 4. Disk Drive
 - B. System and Console Operation
 1. Read and interpret console logs
 2. Operator commands
 3. Use of message manual and interpretation of error
 4. IPL procedures
 5. Running of production jobs
 6. Allocation of real and virtual partitions
 7. Create and use catalogued procedures to perform common operator function such as standard label creation, VTOC-listing, etc.
 8. Become familiar with the procedures necessary to initiate and use operator commands for special system features such as POWER, HASP, JES.
 9. Use of service aids used by operator in determining solutions to system problems
 10. Use of reference manuals.
15. Unit Record Equipment
 - A. Purpose and Description
 - B. Equipment Operation
 1. Card Punch
 2. Sorter
 3. Collator
 4. Reproducer
 5. Interpreter
 6. Separator
 7. Burster
16. Data Processing Installation
 - A. Function within structure of a company
 - B. Operation of an installation
 - C. Data processing personnel
 - D. Specific responsibilities of a computer operator
17. Personal Development
 - A. Work habits
 - B. Job applications
 - C. Job interviews
 - D. Personal traits and appearance
 - E. How to conduct a job search

C. PARTICIPANT ASSESSMENT

1. Examinations

- A. Written Unit exams to be given at the end of each unit of instruction.
- B. Written quizzes to be given at the end of each week of instruction.
- C. Performance exams. A "hands-on" exam on each piece of equipment taught in the course. Performance exams should also be given to test knowledge of system operation, JCL, and use of service aids.
- D. Final exam. Combination of a written and performance exam.

2. Laboratory Assignments

- A. System and equipment laboratory assignments should be a combination of assignments selected from texts and instructor constructed assignments. The student is required to complete at least one lab assignment on each piece of equipment and operational procedure covered in the course.

D. EQUIPMENT, BOOKS, AND SUPPLIES

List of books and supplies to be submitted.

E. SPECIFIC OCCUPATIONAL ADVISORY GROUP (SOAG)

The SOAG will assist the program by reviewing the training for job objective. The SOAG will assist in identifying jobs and in job development. Minutes of meetings will be kept and a copy submitted to the City.

III. RECORD KEEPING

Roll will be taken at beginning and end of each teaching session by each teacher and careful records kept of attendance and tardiness. A sign-in/out sheet will be used and each day's attendance filled with the director. The monthly evaluations will also be maintained in the participant's folder.

IV. CALENDAR OF HOLIDAYS

Participants will be paid for legal holidays and for the following:

Martin Luther King's Birthday
Day after Thanksgiving
Christmas Week (Dec. 24, 26, 27, 28, 1979)
New Year's Eve

PROGRAM ACTIVITY/TRAINING PLAN
STIP II

MACHINE OPERATOR
LOS ANGELES VALLEY COLLEGE
LOS ANGELES COMMUNITY COLLEGE DISTRICT

- I. CLASSROOM TRAINING
 - A. Instructional Methods
 - B. Evaluation of Participants
 - C. Plans to meet Individual Needs
 - D. Determination of Job Readiness
 - E. Linkages with Job Development
and Employability Development Plan
- II. CURRICULUM
 - A. Training Objectives
 - B. Training Activities
 - C. Equipment, Books and Supplies
- III. RECORD KEEPING
- IV. SPECIFIC OCCUPATIONAL ADVISORY GROUP (SOAG)
- V. CALENDAR

I. CLASSROOM TRAINING

The instructional methods of this course will be lectures, discussions, demonstrations, and individual instruction with students using equipment. The student's progress will be monitored with written and manual tests, projects, attendance, and work habits. If any student is having difficulty in any area of the course, he will receive individual instruction by either of the two instructors.

A participant will be deemed ready for placement by agreement of both instructors determined by participant attendance, attitude, work habits, grades, projects, and skill. The participant will progress through the course as shown on the timetable. Both instructors will be responsible for students advancing in accordance with the timetable. As part of the monthly evaluation the students progress will be reviewed in regards to the employability development plan. If necessary, revisions will be made to the EDP. The participant's progress will be evaluated by test taken and projects completed at stated times. Any special needs or potential barriers to employment will be incorporated into the individual's training. The evaluations will be used in job development to identify training objectives and means to accomplish them.

II. CURRICULUM

A. Training Objectives

1. Knowledge of mathematic fundamental and ability to apply as a machinist
2. Ability to interpret, visualize and read blueprints
3. Understand principles and operation of the drill press, engine lathe, milling machine, power hack saw, metal band saw, shapers and grinders
4. Understanding and application of pulley and gearing speeds, quick change gear application, levers, friction drives, tapping, the ending, hand filing, hand sawing, scraping and free hand grinding
5. Application of lathes, mills, contour band saws, shaper and grinders
6. Knowledge of fundamentals of numerical controls
7. Understanding of general manufacturing processes and product planning

B. Training Activities

	<u>APPROXIMATE NUMBER OF HOURS</u>	<u>STAFF RESPONSIBLE</u>
Weeks 1 - 2	40	Instructor
1. Safety test - each participant must study and satisfactorily pass the safety test.		
Weeks 3 - 5	60	Instructor
2. Review the use of basic hand tools.		
3. Review reading and use of the steel scale.		
4. Learn how the micrometer is constructed.		
5. Learn how to read the micrometer.		
6. Practice in the use of the various types of micrometers.		
7. Learn how to read and use the vernier caliper.		
8. Learn the meaning of orthographic projection as viewed on working drawings (blueprints).		
9. Learn how to read and interpret a working drawing.		
Weeks 6 - 10	100	Instructor
10. Learn the construction, function and operation of the basic machine tools (drill press, metal cutting band saw, engine lathe, horizontal, universal, and vertical milling machines.)		
11. Learn about the various cutting tools used on the basic machine tools: drills, lathe tool bits, milling cutters, taps and dies.		
12. Learn how to sharpen drills and grind lathe tool bits.		
13. Learn about the type of cuts used in removing metal on drill presses and milling machines.		
14. Presentation of the initial projects that will involve the use of the basic machine tools.		
15. Demonstration by the instructor on how to set the machines up to perform the various operations required to complete the projects.		
16. Pass out material and assign students to the various machines to begin work on their projects.		

B. Training Activities (cont.)		APPROXIMATE NUMBER OF HOURS	STAFF RESPONSIBLE
Weeks 11 - 20		200	Instructor
17.	Application of the principles and practices learned in weeks 1-10 on assigned projects.		
18.	Continued classroom in preparation for the advanced work to be accomplished in the spring semester.		
Completion of classroom and shop work in weeks 1-20 will qualify the participant for a machine operator "B" entry level position.			
Week 21		20	Instructor
19.	Review safety practices		
Weeks 22 - 30		180	Instructor
20.	At this point the participant has learned how to sharpen and use drills, use taps, dies, reamers, counter bores, and countersinks.		
21.	The participant has also learned to set up work on the drill press, engine lathe and milling machine.		
22.	The participant has completed the parallel bar project and is now ready to start on the parallel clamp project which involves layout procedures using semi and precision tools.		
23.	The participant will perform the following operations on the engine lathe and milling machine: Lathe - face, turn, taper turn, drill, ream, groove Mill - slab milling and end milling Drill press - drill ream, countersink tap Band saw and power hack saw - part off material		
24.	Read working drawings of medium complexity		
Weeks 31 - 40		200	Instructor
25.	The participant has now had sufficient experience to begin work on a production project. The project involves the fabrication of K-D type toolholder. The project will be organized so as to provide an opportunity for the participants to experience the machining of parts that when assembled will provide each student with a K-D type tool holder. Each participant will in rotation learn to machine one of the parts of the K-D type tool holder.		

B. Training Activities (cont.)	APPROXIMATE	STAFF
	<u>NUMBER OF HOURS</u>	<u>RESPONSIBLE</u>
Weeks 41 - 44	80	Instructor

26. The concentration of the last four weeks will be on manufacturing processes, product planning, general machining and press work, foundry equipment and procedures, numerical control and finishing processes.
27. The participant will learn the fundamentals of numerical control and programming techniques.
28. The shop experience will concentrate on tool making practices. Projects will be assigned that include planning, designing, and manufacture of production tools.

At the conclusion of the 44 weeks of training, the participant will be qualified for employment as a machine tool operator "A" entry level position.

III. RECORD KEEPING

Records of the participant attendance by signing in and out will be kept. Records of the participant's performance will be kept and will be incorporated in the monthly evaluation which will be kept in participant's file folder.

IV. SPECIFIC OCCUPATIONAL ADVISORY GROUPS (SOAG)

The SOAG met to review and approve the curriculum. The SOAG will assist in the continuing review and evaluation of the program. They will also assist in identifying jobs and in job development. Minutes of meetings will be submitted to the City.

V. CALENDAR OF HOLIDAYS

Participants will be paid for legal holidays and for the following:

Martin Luther King's Birthday
 Day after Thanksgiving
 Christmas week Dec 24, 26, 27, 28, 1979
 New Year's Eve

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